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10/594,505	09/28/2006	Mitsuo Honma	2006_1629A	1686

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EXAMINER	
CIGNA, JACOB JAMES	
ART UNIT	PAPER NUMBER
3726	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/594,505	HONMA, MITSUO	
	Examiner	Art Unit	
	JACOB J. CIGNA	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/28/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 1, 2, 4-12, and 14-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

2. Each of independent claims 1, 2, and 4-10 recite the limitation "the flattened side edge portions". There is insufficient antecedent basis for this limitation in the claims. For examination purposes, Examiner will assume that a flattened side edge is a circumferential edge of a coil which has been connected to another coil by some flattening step. Examiner notes that the flattening step may flatten the coils from any direction, including but not limited to along the major axis of the coil and from the circumferential edge of the coil.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess (US Patent 1,516,430 hereinafter referred to as HESS) in view of Calomango et al (US Patent 4,955,523 hereinafter referred to as CALOMANGO).

5. As to claim 1, HESS teaches **a method for manufacturing a heat sink having radiating fins** ("heat absorbing and conducting elements" (Page 1 column 2 lines 67-68).) **formed by winding a metal wire into a coil** ("each length of wire being bent upon itself as indicated to provide a plurality of closely spaced over-lapping coils 2" (Page 1 Colulmn2 lines 69-73).) **and secured on radiating substrate** ("The connecting portions of the coils are brazed or otherwise permanently secured to the water tubing C" (Page 1 Column 2 lines 79-81).)**, wherein said radiating fins are formed by flattening said radiating fins to bring flattened loops of said coiled radiating fins of metal wire into close contact with one another** (As shown in Figures 2-4, the coils of wire 2 are flattened so that they are brought into contact with one another. The contact is specifically shown in Figures 3 and 4.) **and securing the flattened side edge portions of said radiating fins onto said radiating substrate** ("The connecting portions of the coils are brazed or otherwise permanently secured to the water tubing C" (Page 1 Column 2 lines 79-81).)**.** HESS does not teach that the coils are secured to the substrate **by soldering**. However, CALOMANGO teaches analogous methods of interconnection of electronic components used for heat transfer. CALOMANGO teaches that brazing (as taught by HESS) and soldering are both useful for connecting a dissipating flange to a substrate: "More preferably, the conductive material is a material which can be used to form a bond once heat has been applied thereto, for example a solder, a brazing material, or a heat-activatable adhesive" (Column 9 lines 46-49). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have secured the coils to the substrate by soldering

because one would have recognized that soldering would have been an adequate substitution for brazing.

6. As to claim 11, HESS in view of CALOMANGO teaches the method for manufacturing a heat sink according to claim 1, wherein **only the side edge portions of said radiating fins to touch said radiating substrate are flattened.** Under the definition provided by HESS for "flattened," "each length of wire being bent upon itself as indicated to provide a plurality of closely spaced over-lapping coils 2. Each of the coils is disposed substantially in a plane" (Page 1 Column 2 lines 69-73), as shown in HESS Figure 3, the only area where the coil 2 is shown to be closely spaced with another coil 2 is near the water tubing C, also recognized as the substrate.

7. Claims 2-10 and 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson (US Patent 2,784,947 hereinafter referred to as PETERSON) in view of Hess (US Patent 1,516,430 hereinafter referred to as HESS) and Calomango et al (US Patent 4,955,523 hereinafter referred to as CALOMANGO).

8. As to claim 2, PETERSON teaches **a method for manufacturing a heat sink** (a plate type heat exchanger) **having radiating fins** (sinuous wire members 14) **secured on radiating substrate** ("a plurality of fin elements are mounted between the inner surfaces of the walls" (Column 2 lines 5-7).)**, wherein slit-like insertion grooves** (channels 16A "are adapted to hold the sinuous wires" (Column 2 line 37).) **are formed in said radiating substrate and inserting the said radiating fins into said insertion grooves in said radiating substrate** (As shown in Figures 1 and 2, the wires 14 are inserted into the channels 16A.)**.** PETERSON does not teach that the **said radiating**

fins are formed by winding a metal wire into a coil and further formed by flattening said radiating fins to bring flattened loops of the coiled radiating fins of metal wire into close contact with one another. However, HESS teaches coiled wire useful for heat dissipation: "heat absorbing and conducting elements" (Page 1 column 2 lines 67-68) such that "each length of wire being bent upon itself as indicated to provide a plurality of closely spaced over-lapping coils 2" (Page 1 Colulmn2 lines 69-73). Thus, HESS teaches flattened coils of metal wire brought into close contact with one another and are "disposed substantially in a plane" (Page 1 Column 2 line 73). Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have provided the flattened metal coils as taught by HESS in the method of making the heat sink as taught by PETERSON because one would have recognized that the coils as taught by HESS would have provided extremely simple construction, effective operation, and inexpensive manufacturing (Page 1 Column 1 lines 21-23) in addition to having a larger surface area than the wire as taught by PETERSON. Further, PETERSON does not teach that the fins are **to be secured onto said radiating substrate by soldering.** Instead, PETERSON teaches, "a process of furnace brazing have proved most satisfactory [in bonding the wires to the channels]" (Column 2 lines 19-20). However, as described in the discussion of claim 1, CALOMANGO teaches analogous methods of interconnection of electronic components used for heat transfer. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have secured any coils to

the channels by soldering because one would have recognized that soldering would have been an adequate substitution for brazing.

9. As to claim 3, the aforementioned obvious combination of PETERSON, HESS, and CALOMANGO teaches **a method for manufacturing a heat sink having radiating fins formed by winding a metal wire into a coil and secured on radiating substrate, wherein said radiating fins are formed by flattening said radiating fins and said radiating fins having side edge portions adhered to said radiating substrate.** PETERSON and HESS do not teach that the fins are secured to the radiating substrate **with a heat conductive adhesive while being in contact with said radiating substrate.** However, as described in the discussion of claim 1, CALOMANGO teaches analogous methods of interconnection of electronic components used for heat transfer. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have secured any coils to the channels by adhesive because one would have recognized that a heat conductive adhesive would have been an adequate substitution for brazing.

10. As to claim 4, the aforementioned obvious combination of PETERSON, HESS, and CALOMANGO teaches **a method for manufacturing a heat sink having radiating fins formed by winding a metal wire into a coil and secured on radiating substrate, wherein that slit-like insertion grooves** (slit-like insertion grooves are the channels 16A by PETERSON) **are formed in said radiating substrate and said radiating fins are formed by flattening said radiating fins to bring flattened loops of the coiled radiating fins of metal wire into close contact with one another and**

inserting the flattened side edge portions of said radiating fins into said insertion grooves in said radiating substrate to be secured onto said radiating substrate by the adhesive (CALOMANGO teaches the wires secured to the substrate by heat-activatable adhesive)**.**

11. As to claim 5, the aforementioned obvious combination of PETERSON, HESS, and CALOMANGO teaches a **method for manufacturing a heat sink having radiating fins formed by winding a metal wire into a coil and secured on radiating substrate, wherein that slit-like insertion grooves are formed in said radiating substrate and said radiating fins are formed by flattening said radiating fins so as to bring flattened loops of the coiled radiating fins of metal wire into close contact with one another, inserting the flattened side edge portions of said radiating fins into said insertion grooves in said radiating substrate.** PETERSON and HESS do not teach **securing said radiating fins onto said radiating substrate by deforming said insertion grooves under pressure.** However, CALOMANGO teaches analogous methods of interconnection of electronic components used for heat transfer. CALOMANGO teaches that brazing (as taught by HESS) and groove-deforming pressure are both useful for connecting a dissipating flange to a substrate: "The bond between the wire and the contact, which is made without the use of a material other than the materials of the contact and the wire, will generally be a weld. The bond may be formed by the application of one or a combination of heat, pressure, and vibration, for example, by thermocompression bonding which utilizes a combination of heat and pressure or by thermosonic or ultrasonic bonding which utilize a

combination of heat, pressure and vibration" (Column 3 lines 35-43). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have secured the coils to the substrate by deforming the insertion grooves under pressure because one would have recognized that a pressure weld would have been an adequate substitution for brazing.

12. As to claim 6, the aforementioned obvious combination of PETERSON, HESS, and CALOMANGO of claim 2 teaches **a method for manufacturing a heat sink having radiating fins formed by winding a metal wire into a coil and secured on radiating substrate, wherein that slit-like insertion grooves are formed in said radiating substrate and said radiating fins are formed by flattening said radiating fins to bring flattened loops of the coiled radiating fins of metal wire into close contact with one another, inserting the flattened side edge portions of said radiating fins into said insertion grooves in said radiating substrate, and securing said radiating fins onto said radiating substrate by deforming said insertion grooves under pressure.** Further, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have secured the coils to the substrate by vibratingly deforming the insertion grooves under pressure because one would have recognized that a **vibrational** pressure weld would have been an adequate substitution for brazing.

13. As to claim 7, the aforementioned obvious combination of PETERSON, HESS, and CALOMANGO of claim 3 teaches **a method for manufacturing a heat sink having radiating fins formed by winding a metal wire into a coil and secured on**

radiating substrate, wherein that said radiating fins are formed by flattening said radiating fins so as to bring flattened loops of the coiled radiating fins of metal wire into close contact with one another and securing the flattened side edge portions of said radiating fins onto said radiating substrate. PETERSON and HESS do not teach that the fins are secured to the radiating substrate **by flash welding.** However, as described in the discussion of claim 5, CALOMANGO teaches analogous methods of interconnection of electronic components used for heat transfer. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have secured any coils to the channels by welding because one would have recognized that a flash-weld would have been an adequate substitution for brazing.

14. As to claim 8, the aforementioned obvious combination of PETERSON, HESS, and CALOMANGO of claim 2 teaches **a method for manufacturing a heat sink having radiating fins formed by winding a metal wire into a coil and secured on radiating substrate, wherein that slit-like insertion grooves are formed in said radiating substrate and said radiating fins are formed by flattening said radiating fins to bring flattened loops of the coiled radiating fins of metal wire into close contact with one another and inserting the flattened side edge portions of said radiating fins into said insertion grooves in said radiating substrate to be secured onto said radiating substrate by flash welding** (CALOMANGO teaches the wires secured to the substrate by welding**).**

15. As to claim 9, the aforementioned obvious combination of PETERSON, HESS, and CALOMANGO of claim 3 teaches **a method for manufacturing a heat sink having radiating fins formed by winding a metal wire into a coil and secured on radiating substrate, wherein that said radiating fins are formed by flattening said radiating fins to bring flattened loops of the coiled radiating fins of metal wire into close contact with one another and securing the flattened side edge portions of said radiating fins onto said radiating substrate.** PETERSON and HESS do not teach securing the wires **by vibrational welding.** However, as described in the discussion of claim 5, CALOMANGO teaches analogous methods of interconnection of electronic components used for heat transfer. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have secured any coils to the channels by vibrational welding because one would have recognized that a vibrational-weld would have been an adequate substitution for brazing.

16. As to claim 10, the aforementioned obvious combination of PETERSON, HESS, and CALOMANGO of claim 2 teaches **a method for manufacturing a heat sink having radiating fins formed by winding a metal wire into a coil and secured on radiating substrate, wherein that slit-like insertion grooves are formed in said radiating substrate and said radiating fins are formed by flattening said radiating fins to bring flattened loops of the coiled radiating fins of metal wire into close contact with one another and inserting the flattened side edge portions of said radiating fins into said insertion grooves in said radiating substrate to be secured**

onto said radiating substrate by vibrational welding (CALOMANGO teaches the wires secured to the substrate by vibrational-welding).

17. As to claims 12 and 16-20, PETERSON in view of HESS and CALOMANGO teaches the method for manufacturing a heat sink according to claims 2, 4-6, 8, or 10 respectively, wherein **only the side edge portions of said radiating fins to be fitted into said insertion grooves in said radiating substrate are flattened.** It has been shown obvious that the coil as taught by HESS would have been fitted into the insertion grooves of PETERSON. Under the definition provided by HESS for flattened, "each length of wire being bent upon itself as indicated to provide a plurality of closely spaced over-lapping coils 2. Each of the coils is disposed substantially in a plane" (Page 1 Column 2 lines 69-73), as shown in HESS Figure 3, the only area where the coil 2 is shown to be closely spaced with another coil 2 is near the water tubing C, also recognized as the substrate.

18. As to claims 13-15, PETERSON in view of HESS and CALOMANGO teaches the method for manufacturing a heat sink according to claims 3, 7, or 9 respectively, wherein **only the side edge portions of said radiating fins to touch said radiating substrate are flattened.** Under the definition provided by HESS for flattened, "each length of wire being bent upon itself as indicated to provide a plurality of closely spaced over-lapping coils 2. Each of the coils is disposed substantially in a plane" (Page 1 Column 2 lines 69-73), as shown in HESS Figure 3, the only area where the coil 2 is shown to be closely spaced with another coil 2 is near the water tubing C, also recognized as the substrate.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACOB J. CIGNA whose telephone number is (571) 270-5262. The examiner can normally be reached on Monday - Friday 9:30am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on (571) 272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JACOB J CIGNA/
Examiner, Art Unit 3726
March 12, 2010

/DAVID P. BRYANT/
Supervisory Patent Examiner, Art Unit 3726